

CLAIMS

1. A magnetic head for recording information on a relatively-moving medium, the head having a leading end, a trailing end, and a medium-facing surface, the head comprising:

a first soft magnetic layer extending a first distance substantially perpendicular to the medium-facing surface and terminating at a first pole tip disposed adjacent to said medium-facing surface, said first pole tip having a leading edge and a trailing edge, wherein said trailing edge is substantially larger than said leading edge;

a second soft magnetic layer extending substantially perpendicular to the medium-facing surface and terminating at a second pole tip disposed adjacent to said medium-facing surface, said second pole tip having a medium-facing area that is substantially larger than that of said first pole tip; and

a third soft magnetic layer extending a second distance substantially perpendicular to the medium-facing surface, adjoining said first soft magnetic layer and terminating further than said first pole tip from said medium-facing surface, wherein said second distance is more than half said first distance.

2. The head of claim 1, wherein said first pole tip has a trapezoidal shape.

3. The head of claim 1, wherein first second soft magnetic layer has a cross-sectional shape at a location at least one micron from said second pole tip that is substantially equal to a face of second pole tip.

4. The head of claim 1, wherein said first pole tip is separated from said second pole tip by at least one micron.

5. The head of claim 1, further comprising a magnetoresistive sensor disposed adjacent to one of said pole tips.

6. The head of claim 1, further comprising an electrically conductive coil section disposed between said second and third soft magnetic layers, wherein said third soft magnetic layer is disposed closer than said coil section to said medium-facing surface.

7. The head of claim 1, wherein the medium has an easy axis of magnetization substantially perpendicular to said medium-facing surface.

8. The head of claim 1, wherein the medium has a soft magnetic underlayer.

9. A magnetic head for recording information on a spinning disk, the head having a leading end, a trailing end, and a disk-facing surface, the head comprising:

a first soft magnetic layer disposed in said head and terminating at a first pole tip disposed adjacent to said disk-facing surface,

a second soft magnetic layer disposed in said head and terminating at a second pole tip disposed adjacent to said disk-facing surface, said second pole tip having a leading edge and a trailing edge, wherein said leading edge is disposed further than said trailing edge from said leading end and said trailing edge is substantially larger than said leading edge;

an electrically conductive coil section disposed between said first and second soft magnetic layers; and

a third soft magnetic layer adjoining said second soft magnetic layer, said third soft magnetic layer terminating further than said second pole tip from said disk-facing surface, said third soft magnetic layer terminating closer than said coil section to said disk-facing surface.

10. The head of claim 9, wherein said second pole tip has a trapezoidal shape.

11. The head of claim 9, wherein said second soft magnetic layer has a cross-sectional shape at a location at least one micron from said second pole tip that is substantially equal to a shape of second pole tip.

12. The head of claim 9, further comprising a magnetoresistive sensor disposed adjacent to one of said pole tips.
13. The head of claim 9, wherein said first pole tip includes a pair of peninsulas.
14. The head of claim 9, wherein said first pole tip is separated from said second pole tip by at least one micron.
15. The head of claim 9, wherein the disk has a media layer with an easy axis of magnetization substantially perpendicular to said disk-facing surface.
16. The head of claim 9, wherein the disk has a soft magnetic underlayer.

17. An information storage system comprising:

a rigid disk spinning about a disk center, said disk having a media layer adjacent to a disk surface, the media layer having an easy axis of magnetization that is substantially perpendicular to the disk surface;

an arm having a free end adjacent to said disk surface, said arm adapted to move said end toward and away from said disk center;

a head coupled to said free end, said head having a leading end, a trailing end, and a disk-facing surface, said disk-facing surface disposed adjacent to said disk surface;

a first soft magnetic layer disposed in said head and terminating in a first pole tip disposed adjacent to said disk-facing surface;

a second soft magnetic layer disposed in said head and terminating in a second pole tip disposed adjacent to said disk-facing surface, said second pole tip having a leading edge and a trailing edge, wherein said trailing edge is disposed closer than said leading edge to the trailing end and said trailing edge is substantially larger than said leading edge;

an electrically conductive coil section disposed between said first and second soft magnetic layers; and

a third soft magnetic layer adjoining said second soft magnetic layer, said third soft magnetic layer terminating further than said second pole tip from said disk-facing surface, said third soft magnetic layer terminating closer than said coil section to said disk-facing surface.

18. The system of claim 17, wherein said second pole tip is disposed adjacent to a substantially circular disk track that is concentric with said disk center, and said trailing edge is not perpendicular to said disk track at a point of said track that is nearest to said trailing edge.

19. The system of claim 17, wherein said disk has first and second substantially circular and concentric tracks, and said pole tips are aligned with said first track and not aligned with said second track.

20. The system of claim 17, wherein said second pole tip has a trapezoidal shape.

21. The system of claim 17, further comprising a magnetoresistive sensor disposed adjacent to one of said pole tips.

22. The system of claim 17, wherein said pole tips are separated from each other by at least one micron.

23. The system of claim 17, wherein said disk has a soft magnetic underlayer disposed adjacent to said media layer.

24. The device of claim 17, wherein said media layer has pattern of magnetization with a trapezoidal shape.

25. The system of claim 17, wherein said second soft magnetic layer has a cross-sectional shape at a location at least one micron from said second pole tip that is substantially equal to a shape of second pole tip.